Notice No.1

for the
Code for Lifting Appliances in a Marine Environment
July 2019

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note for the corrigenda items paragraphs, Tables and Figures are not shown in their entirety.

Issue date: November 2019

Amendments to	Effective date	IACS/IMO implementation (if applicable)
Chapter 4, Sections 1, 2, 7 & 8	1 January 2020	NA
Chapter 4, Section 4	Corrigendum	NA
Chapter 9, Section 5	Corrigenda	NA
Chapter 10, Section 2	Corrigenda	NA
Chapter 12, Sections 1& 3	1 January 2020	NA
Chapter 13, Section 3	Corrigenda	NA

Lloyd's Register

Chapter 4
Cranes and Submersible Lifting Appliances

■ *Section 1*
Introduction

1.2 Lifting appliances and crane types

(Part only shown)

1.2.1 This Chapter will be the basis of approval by Lloyd's Register (herein after referred to as LR) of the following types of crane or fitting appliance:

(i) Launch and recovery appliances for small watercraft which are manned while being handled.

(j) Launch and recovery appliances for small watercraft which are unmanned while being handled.

Listed item (i) has been renumbered (k).

■ *Section 2*
Shipboard cranes

2.23 Allowable stress – Joints and connections

2.23.1 For welded joints, the physical properties of the weld metal are considered as equal to the parent metal. For full penetration butt welds, the allowable stress is equal to the allowable ~~tensile~~ stress of the parent material (*see Ch 4, 2.17 Allowable stress – Elastic failure*).

■ *Section 4*
Submersible handling systems

4.9 Rope safety factors

4.9.2 The safety factor for wire ropes used for unmanned submersibles is to be determined from the following expression:

$$SF_{swh} = \frac{10^4}{\frac{200}{27}SWL + \frac{43000}{27}} \frac{F_{h,swh}}{1{,}7}$$

where

SF_{swh} = safety factor required at significant wave height (swh)

$F_{h,swh}$ = hoisting factor at a specific swh derived in accordance with *Ch 4, 4.4 Dynamic forces*

SWL = safe working load of the submersible handling system

For submersible handling systems with $SWL \leq$ ~~160t~~ $10t$, $SF = 6{,}0 \frac{F_{h,swh}}{1{,}7}$

and $SWL \geq$ ~~10t~~ $160t$, $SF = 3{,}6 \frac{F_{h,swh}}{1{,}7}$.

The factor $\frac{F_{h,swh}}{1{,}7}$ is not to be taken as less than 1,0.

■ *Section 7*
Launch and recovery appliances for manned ~~tender boats~~ small watercraft

7.1 General

(Part only shown)

7.1.5 The requirements of this Section are considered appropriate for launch and recovery operations carried out under the following conditions:

(c) operating temperature is ~~above~~ higher than -50°C and ~~below~~ lower than +45°C;

(d) minimum design temperature~~s~~ is ~~above~~ higher than -40°C (*see Ch 4, 2.25 Materials, 2.25.3*);

7.2 Terms and definitions

7.2.3 Safe Working Load (SWL). The general definition of the SWL of a lifting appliance is included in *Ch 1, 2.1 Safe Working Load (SWL) of a lifting appliance* ~~of a lifting appliance~~. Within the context of this Section, the maximum static load for appliances used for the launch and/or recovery of manned ~~tender boats~~ small watercraft is defined as the fully laden weight of the ~~tender boat~~ small watercraft, including the crew required to handle the ~~tender boat~~ manned small watercraft.

7.2.5 ~~Tender boat~~ Manned small watercraft is defined as a ~~small craft~~ tender boat or workboat, which is carried on the mothership for the purposes of transferring crew, passengers or other personnel and which are both manned while being handled.

7.3 Loads and design factors

7.3.1 A risk coefficient, ~~γ_n~~γ_n, shall be applied to ~~the dead load and~~ the SWL of the appliance to account for the increased risk associated with personnel handling. The risk coefficient shall be taken as follows:

(a) for $h \leq 3$ m: ~~$\gamma_n = 1{,}05$~~$\gamma_n = 1{,}20$;

(b) for $h \geq 10$ m: ~~$\gamma_n = 1{,}5$~~$\gamma_n = 1{,}70$;

(c) for 3 m < ~~h~~h < 10 m: ~~$\gamma_n = \frac{9}{140}h + \frac{6}{7}$~~. $\gamma_n = \frac{1}{14}h + \frac{69}{70}$.

where

h = lifting height as measured between the waterline of the mothership and the bottom of the keel of the ~~tender boat~~ manned small watercraft (in metres).

A risk coefficient, $\gamma_{n.DL}$, shall be applied to the dead load of the appliance to account for the increased risk associated with personnel handling. The risk coefficient shall be taken as follows:

(a) for $h \leq 3$ m: $\gamma_{n.DL} = 1{,}05$;

(b) for $h \geq 10$ m: $\gamma_{n.DL} = 1{,}50$;

(c) for 3 m < h < 10 m: $\gamma_{n.DL} = \frac{9}{140}h + \frac{6}{7}$

Proposals for the application of alternative risk factors will be specially considered.

7.3.2 In case of the absence of actual dynamic factors, the hoisting factor shall be taken as follows:

(a) for $H_{1/3} \leq 0{,}6$ m: ~~$F_h = 1{,}46$~~$F_h = 1{,}30$;

(b) for $H_{1/3} \leq 1{,}0$ m: ~~$F_h = 1{,}60$~~$F_h = 1{,}45$.

Values for hoisting factors between $H_{1/3}$ of 0,6 m and 1,0 m may be linearly interpolated.

The application of lower hosting factors will be specially considered if supported by an acceptable technical justification. $H_{1/3}$ is generally limited to 1,0 m. The hoisting factor for $H_{1/3}$ beyond 1,0 m will be specially considered. The application of higher dynamic factors, other than those given above, shall be considered if required by design implications and/or environmental circumstances.

7.3.9 Any loads arising from stowage of the manned small watercraft due to storing on the launch and recovery appliance are to be taken into consideration (e.g. small watercraft hanging from or resting on the appliance).

7.4 Machinery

7.4.7 The minimum number of wraps necessary for fibre ropes installed on winch drums will be specially considered. End terminations (for the drum and elsewhere in the reeving system) shall adequately secure the fibre rope to the winch drum (and other dead ends in the reeving system) in accordance with the rope manufacturer's recommendations. Reference is made to the requirements of *Ch 8, 7.3 Splicing and terminal connections*.

7.4.11 For the design of machinery items the risk coefficient (*see Ch 4, 7.3 Loads and design factors 7.3.1*) shall be multiplied with the dynamic load (*see Ch 4, 7.3 Loads and design factures 7.3.2* and *Ch 4, 7.3 Loads and design factors 7.3.3*). The risk coefficient need not be applied to establish the required brake torque and dimensioning of the motor or gearing.

7.5 Ropes and loose gear

7.5.1 The wire rope safety factor shall be determined in accordance with the requirements of *Ch 4, 3.9 Rope safety factors* and this safety factor shall be a minimum of ~~6~~5. The derived rope safety factor shall further be multiplied with the risk coefficient as defined in *Ch 4, 7.3 Loads and design factors 7.3.1*. Rope safety factors for significant wave heights beyond 1,0 m will be specially considered.

7.5.2 The man-made fibre rope safety factor shall be determined in accordance with the requirements of *Ch 4, 7.5 Ropes and loose gear 7.5.1* and shall be multiplied by a factor of 1,25. The instructions for use issued by the fibre rope manufacturer and any requirements, pre-cautions and limitations stated therein are to be complied with. These instructions are to be made available to the ~~competent person and~~ attending Surveyor.

7.5.4 The hook is to have a safety factor of $\gamma_n \times 5$ against the ultimate tensile strength of the materials used. The derived safety factor shall be a minimum of 6.

7.5.5 The hook block is to comply with the requirements of *Ch 8, 3.5 Hook blocks*. With respect to *Ch 8, 3.5 Hook blocks 3.5.1(a)* the required safety factor against the ultimate tensile strength is generally set to $\gamma_n \times 5$ and this safety factor shall be a minimum of 6. With respect to *Ch 8, 3.5 Hook blocks 3.5.1(b)*, the risk coefficient γ_n shall be applied to the dead load and SWL.

7.5.6 Loose gear items are to have a safety factor of $\gamma_n \times 5$ against the ultimate tensile strength of the materials used. The derived safety factor shall be a minimum of 6.

7.5.7 Spreaders and lifting beams are to comply with *Ch 8, 4 Spreaders and Lifting beams* and the risk coefficient γ_n shall be applied to the dead load and SWL.

Existing paragraphs 7.5.4 to 7.5.8 have been renumbered 7.5.8 to 7.5.12.

7.6 Instructions for use

7.9 Testing and surveys requirements

7.9.1 ~~The testing of the appliance is to be carried out in accordance with the requirements of *Ch 12 Testing, Marking and Surveys* as applicable.~~ The testing, marking and survey of the appliance is to be carried out in accordance with the requirements of *Ch 12 Testing, Marking and Surveys* as applicable.

Existing paragraphs 7.9.2 to 7.9.5 have been deleted.

7.10 Inspection before use

7.10.1 Before any launching or recovery operation commences, an inspection/examination of the appliance and associated gear/equipment/components is required prior to each individual manned use. The manned small watercraft shall first be lowered and hoisted for a few meters without persons on board in order to ascertain that the arrangement operates safely and correctly. The inspection/examination shall be documented and shall be made available to the attending Surveyor.

■ *Section 8*

Launch and recovery appliances for unmanned small watercraft

8.1 General

8.1.1 This Section covers the design requirements for the launch and recovery appliances for small watercraft, such as tender boats (including workboats), personal watercraft and similar equipment which are unmanned while being handled.

8.1.2 The requirements of *Ch 4, 2 Shipboard cranes* are also to be complied with unless specified differently within this Section.

8.1.3 The requirements of this Section are considered appropriate for launch and recovery operations carried out under the following conditions:

(a) the mothership supporting the appliance shall be stationary;
(b) operations are conducted in harbour or sheltered water conditions;
(c) operating temperature is higher than -50°C and lower than +45°C;
(d) minimum design temperatures higher than -40°C (*see Ch 4, 2.25 Materials 2.25.3*);
(e) heel and trim of the mothership do not exceed 5° and 2° respectively;
(f) significant wave height does not exceed 1,0 m;
(g) view to watercraft being lifted; and
(g) daylight visibility or equivalent.

8.1.4 The scope of this Section does not include:

(a) lifting, handling and erection of the appliance or its components;
(b) transport of appliances and/or their components;
(c) collision loads, e.g. collision of the small watercraft with the hull of the mothership or with an object in the water, etc.;
(d) assembling or disassembling of the appliance and/or its components;
(e) scrapping or disabling of the appliance and/or its components;
(f) appliances for life-saving; and
(g) appliances installed on naval vessels.

8.1.5 The designer shall evaluate any additional arrangement requirements based on the operational profile of the appliance. The operational profile shall be decided in collaboration with the Owner/Operator, such that it is fully understood by all parties. The operational profile and any additional requirements are to be communicated to LR for consideration.

8.1.6 The responsible National Authorities and Flag States may have additional requirements which need to be adhered to. In case of any conflict arising between these requirements and those of the National Authorities and Flag States, the requirements of the National Authorities and Flag States take precedence.

8.2 Terms and definitions

8.2.1 The definitions of the terms machinery, mothership and significant wave height are given in *Ch 4, 7.2 Terms and definitions*.

8.2.2 Safe Working Load (SWL). The general definition of the SWL of a lifting appliance is included in *Ch 1, 2.1 Safe Working Load (SWL) of a lifting appliance*. Within the context of this Section, the maximum static load for appliances used for the launch and/or recovery of unmanned small watercraft is defined as the fully laden weight (e.g. including equipment, fuel, etc.).

8.2.3 Unmanned small watercraft is defined as a tender boat or workboat, which is carried on the mothership for the purposes of transferring crew, passengers or other personnel; personal watercraft which is carried on the mothership for the purposes of recreational activities; and similar equipment; and which are all unmanned while being handled.

8.3 Loads and design factors

8.3.1 In case of the absence of actual dynamic factors, the hoisting factor shall be taken as follows:

(a) for $H_{1/3}$ ≤ 0,6 m: $\mathrm{F_h} = 1{,}30$;
(b) for $H_{1/3}$ ≤ 1,0 m: $\mathrm{F_h} = 1{,}45$.

Values for hoisting factors between for $H_{1/3}$ of 0,6 m and 1,0 m may be linearly interpolated.

The application of lower hoisting factors will be specially considered if supported by an acceptable technical justification. $H_{1/3}$ is generally limited to 1,0 m. The hoisting factor for $H_{1/3}$ beyond 1,0 m will be specially considered. The application of higher dynamic factors, other than those given above, shall be considered if required by design implications and/or environmental circumstances.

8.3.2 The duty factor shall be determined in accordance with the requirements of *Ch 4, 2.3 Duty factor*.

8.3.3 The heel and trim angles of the mothership shall be taken as 5° and 2° respectively. The heel and trim angles shall be applied to the dead weight of the appliance and the SWL. The heel and trim angles for values of $H_{1/3}$ above 1,0 m will be specially considered.

8.3.4 In cases where $H_{1/3} \geq 1{,}0$ m, the mothership accelerations are to be taken into consideration.

8.3.5 The offlead and sidelead angles (which are to be applied to the SWL) are both taken to be a minimum of 3° unless environmental or other conditions require higher angles to be applied. The offlead and sidelead angles are to be applied in addition to the heel and trim angles of the mothership. Consideration will be given to lower angles if it can be demonstrated that such angles can be effectively restricted. The offlead and sidelead angles for $H_{1/3}$ above 1,0 m will be specially considered.

8.3.6 If necessary, adjustable bow lines (painters) and bowsing lines should be used in order to stabilise the small watercraft and in order to avoid swinging of the small watercraft.

8.3.7 Effects of wind on small watercraft shall be considered. The design wind speeds and force coefficients shall be determined in accordance with the requirements of *Ch 4, 2.12 Wind loading*.

8.3.8 Any loads arising from stowage of the small watercraft due to storing on the launch and recovery appliance are to be taken into consideration (e.g. small watercrafts hanging from or resting on the appliance).

8.4 Machinery

8.4.1 The requirements for machinery items are defined in *Ch 9 Machinery* as applicable. Reference is made to *Ch 9, 1.1 General, 1.1.2* in particular.

8.4.2 The minimum number of wraps necessary for fibre ropes installed on winch drums will be specially considered. End terminations (for the drum and elsewhere in the reeving system) shall adequately secure the fibre rope to the winch drum (and other dead ends in the reeving system) in accordance with the rope manufacturer's recommendations. Reference is made to the requirements of *Ch 8, 7.3 Splicing and terminal connections*.

8.4.3 Winch drum connections and end terminations for wire and fibre ropes shall be of an approved type.

8.4.4 The accumulated number of operating load cycles shall be recorded in order to ensure that the design lifetime of any part of the appliance (e.g. rope, winch gear, structure, etc.) is not exceeded during the service life of the appliance. This information is to be made available to the attending Surveyor.

8.5 Ropes and loose gear

8.5.1 The wire rope safety factor shall be determined in accordance with the requirements of *Ch 4, 3.9 Rope safety factors*. Rope safety factors for significant wave heights beyond 1,0 m will be specially considered.

8.5.2 The man-made fibre rope safety factor shall be determined in accordance with the requirements of *Ch 4, 8.5 Ropes and loose gear 8.5.1* and shall be multiplied by a factor of 1,25. The instructions for use issued by the fibre rope manufacturer and any requirements, pre-cautions and limitations stated therein are to be complied with. These instructions are to be made available to the attending Surveyor.

8.5.3 The maximum number of guaranteed load cycles for the fibre rope shall be provided by the fibre rope manufacturer. The actual load cycles the reeving system is subjected to, shall be recorded and compared with the number of guaranteed load cycles for the fibre rope.

8.5.4 Hooks are to be forged. Special consideration will be given to alternative proposals.

8.5.5 Where the appliance is equipped with more than one reeving system (e.g. two beams, each with a separate reeving system), details of the arrangements to prevent unequal lowering or hoisting of the small watercraft are to be submitted for consideration and the effectiveness shall be demonstrated to the attending Surveyor.

8.6 Instructions for use

8.6.1 Instructions for use and the maintenance manual are required to be provided. The instructions for use shall cover all operational and emergency procedures, including any conditions, pre-cautions and limitations for unmanned small watercraft launching and recovery operations.

8.6.2 The instructions for use and the marking of the appliance shall state that it is not to be used for the handling of personnel.

8.7 Continuous improvement

8.7.1 The requirements for continuous improvement are defined in *Ch 4, 7.7 Continuous improvement*.

8.8 Risk assessment

8.8.1 In case it is intended to deviate from the requirements as stipulated in this Section, it is required to follow the requirements given in *Ch 4, 7.8 Risk assessment*.

8.8.2 It is, in general, recommended to carry out a risk assessment for the appliance under due consideration of the conditions of the system (e.g. mothership, environmental) the appliance will be installed in and the interfaces between the appliance and the mothership. The risk assessment shall be carried out taking into account the methodology as given in *Ch 4, 7.8 Risk assessment*.

8.9 Testing and survey requirements

8.9.1 The testing, marking and survey of the appliance is to be carried out in accordance with the requirements of *Ch 12 Testing, Marking and Surveys* as applicable.

Existing Section 8 has been renumbered 9.

Chapter 9
Machinery

■ *Section 5*
Hydraulic cylinders

5.9 Testing

5.9.4 The designer shall ensure that the hydraulic cylinder design is able to withstand the hydraulic test pressure as defined in *Ch 9, 5.9 Testing 5.9.1* and the proof load testing of the lifting or life-saving appliance. The proof loads for lifting appliances are defined in ~~internal cylinder diameter, in mm~~ *Ch 12, 1.5 Derricks and derrick cranes*. The proof loads for life-saving appliances are defined in *Ch 3, 1.12 Testing*. The actual stresses due to the applied test pressure and due to proof load testing of the hydraulic cylinders shall not exceed the allowable stresses stated in the relevant chapters applicable to the appliance being considered (*see Ch 4, 2.17 Allowable stress – Elastic failure* for the test loadcase (case 4) for both lifting and life-saving appliances, *Ch 6, 5.2 Load combinations* for Ro-Ro access equipment, etc.).

Chapter 10
Electrotechnical Systems

■ *Section 2*
Control, alarm and safety systems

2.1 General

2.1.1 The requirements of *Ch 10, 2 Control, alarm and safety systems*, *Ch 10, 3 Control and supervision of lifts for passengers and crew* and *Ch 10, 4 Control and supervision of lifting appliances for cargo handling* apply to all permanently installed, power operated, lifting appliances specified in *Ch 10, 2.2 Documentation 2.2.2* which are intended to be classed. Where applicable, the relevant requirements for control, alarm and safety systems as stated in *Pt 6, Ch 1, 1 General requirements* and *Pt 6, Ch 1, 2 Essential features for control, alarm, monitoring and safety systems* of the *Rules and Regulations for the Classification of Ships, July 2019* ~~(hereinafter referred to as the Rules for Ships)~~ are to be complied with.

Chapter 12
Testing, Marking and Surveys

■ *Section 1*
Testing

1.8 Launch and recovery appliances for manned small watercraft

1.8.1 The testing of the appliance is to be carried out in accordance with the requirements of *Ch 12 Testing, Marking and Surveys* as applicable.

1.8.2 Testing with overload: Notwithstanding the requirements in *Ch 12, 1.6 Cranes and ROV handling systems 1.6.1* and *Table 12.1.5 Testing of derricks and cranes*, the test load for the appliance shall be taken as follows:
SWL ≤ 20 t: 1,50 × SWL
20 t < SWL ≤ 50 t: SWL + 10 t
SWL > 50 t: 1,20 × SWL

1.8.3 Testing with SWL: Notwithstanding the requirements in *Ch 12, 1.6 Cranes and ROV handling systems 1.6.6*, the crane shall be tested with 1,1 times SWL instead of 1,0 times SWL.

1.8.4 Each of the primary and secondary brakes shall be statically tested to at least 1,5 times SWL and dynamically tested to at least 1,1 times SWL.

Existing sub-Sections 1.8 to 1.10 have been renumbered 1.9 to 1.11.

■ *Section 3*
Survey requirements

3.4 Initial Survey of existing installations

Table 12.3.2 Intervals between Periodical Thorough Examinations

Lifting appliance	~~Survey~~ Examination type and interval
Cranes and derrick cranes	Annual Thorough Examination ~~Survey~~
Lifting appliances on fixed and mobile offshore installations	Annual Thorough ~~Survey~~ Examination
Lifting appliances on fixed and mobile offshore installations used for manned diving operations	6-monthly Thorough ~~Survey~~ Examination
Lifting appliances for manned diving systems	6-monthly Thorough ~~Survey~~ Examination
Lifting appliances handling personnel	~~Survey~~ 6-monthly Thorough Examination
Launch and recovery appliances for manned tender boats	~~Survey~~ 6-monthly Thorough Examination
~~Lifts – Manually operated~~	~~Annual Thorough Survey~~
~~Lifts - Powered~~	~~Annual Thorough Survey~~
Lifts	~~Survey~~ Annual Thorough Examination
Ramps	Annual Thorough ~~Survey~~ Examination
~~Mechanical lift docks~~ Shiplift and transfer systems	*See* Chapter 4 5
Launch and recovery appliances for survival craft and rescue boats	*See* Chapter 3

Note 1. Annual Thorough ~~Surveys~~ Examinations are to be held once in every 12-month period, unless otherwise stated by the ship's Flag Administration.
Note 2. The thorough examination of the appliances and its associated equipment by a competent person shall be documented and shall be made available to the attending Surveyor.

Chapter 13
Documentation

■ *Section 3*
Classification procedure

3.1 General

(Part only shown)

Table 13.3.1 Minimum requirements for the classification of lifting appliances

Classification process step	Component	Required or issued documentation	References
2 Verification of materials Remark: Materials are required to be delivered from a Lloyd's Register approved works	Structural materials	'LR certificate' or 'Manufacturer's certificate validated by LR' as defined in *Ch 1, 3 Certification of materials* of the *Rules for the Manufacture, Testing and Certification of Materials, July 2019* (equivalent to inspection certificate EN 10204, 3.2)	LR *Rules for the Manufacture, Testing and Certification of Materials, July 2019* LR *Rules and Regulations for the Classification of Ships, July 2019* Relevant Chapters of this Code
	~~Hydraulic pipes/hoses~~		
	Loose gear		
	Piping systems	*See Pt 5, Ch 12 Piping Design Requirements* of the *Rules and Regulations for the Classification of Ships, July 2019*	

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